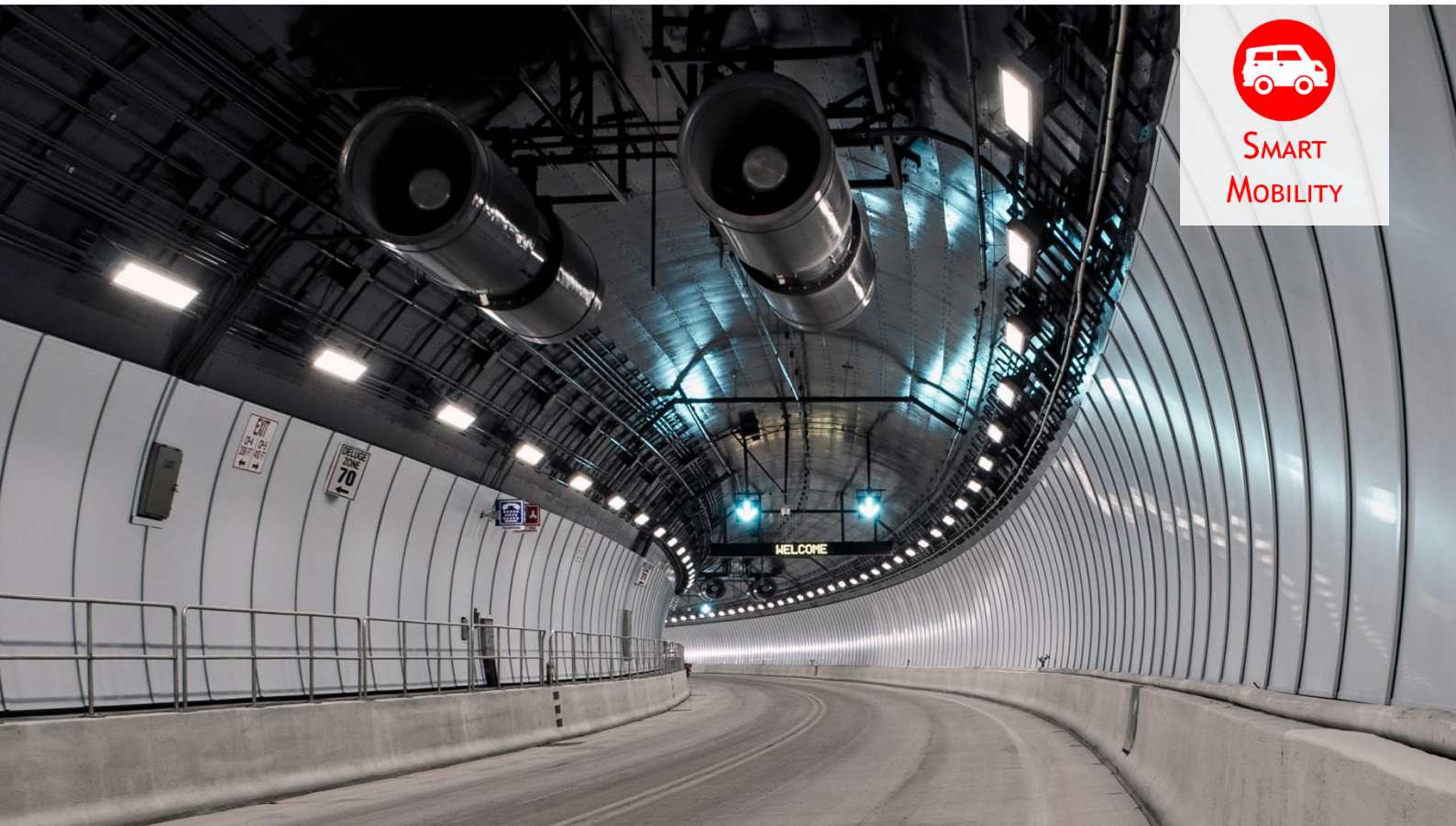




SMART
MOBILITY



COMPREHENSIVE TUNNEL MANAGEMENT SYSTEM

SICE offers a comprehensive tunnel management system based on centralized monitoring and distributed control of installed systems and equipment.

The system's objectives are:

- Improved user safety in tunnels.
- A reduction in operating and maintenance costs.
- Intelligent accident management and equipment maintenance.
- Improved system and infrastructure reliability.
- Efficient control of integrated system equipment.

The system, which is modular and open, can be modified for each operating plan and different types of equipment. The design engineering and system characteristics allow integration within a sole display and command interface for all Tunnel elements.

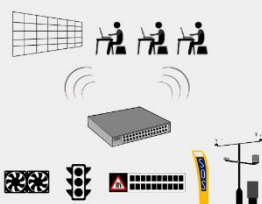
SICE has the ability to design, develop, install, maintain and operate all levels of comprehensive tunnel management system hardware and software:

LEVEL 0 - Control Centre

LEVEL 1 - Communications

LEVEL 2 - Local Control Network, remote units, PLCs

LEVEL 3 - On site systems and equipment



OVERVIEW

SICE develops and implements comprehensive solutions for the management and control of tunnels, working on both the security and control and electromechanical aspects of the facilities, as well as managing their maintenance and operation.

SICE has implemented its technology to improve the intelligence of the infrastructures along more than 300 km of tunnels.

It has many important references in the United States, Chile, Colombia, Australia, Spain and Portugal, and it has implemented the total integration of the Calle 30 tunnels in Madrid (a global benchmark for urban tunnels).

COMPREHENSIVE TUNNEL MANAGEMENT

The comprehensive solution for the centralized management of intelligent transport systems is based on a software platform called SIDERA.

The main function of SIDERA is to acquire data from all tunnel sensors, integrating that information and subsequent changes to control elements. SIDERA also manages and records maintenance work.

It provides infrastructure operators with a multi-language interface which is easy to use, displaying interactive maps and schematics of facilities, equipment status and accident development at all times.



EQUIPMENT AND SYSTEMS INTEGRATED BY SICE

The SICE tunnel control system allows integration of any equipment or system, including:

- Energy systems. Low-level, mid-level, generators, UPS.
- Lighting, emergency, individual lighting control (DALI).
- Ventilation equipment.
- Filtering and pumping stations.
- Tunnel environment sensors (CO and NOx detectors, opacimeters, anemometers).
- Fire detection and extinguishing system (fire hose, water mist).
- Access control and surveillance of technical areas and switchboards.
- CCTV system.
- Checkpoint control.
- Emergency exits.

SIDERA's main characteristics are:

- Architecture based on scalable components
- Centralized management and control of multi-tunnel systems.
- Easy integration of new functionalities, making use of different tools (MAXIMO, PRISMA, Cristal Report...).
- Handling on-site equipment through PLCs and/or remote stations (ERUT).
- System redundancy through high-availability Hardware.
- System operation in automatic, semi-automatic, forced or manual mode.
- Compliance with a wide range of standards (European, Australian and American).

In terms of ensuring security and tunnel operation conditions, SIDERA implements the following automatic features, amongst others:

- Automatic fire detection
- Emergency ventilation during a fire.
- Fire extinguisher equipment control algorithms.
- Overall or section-based general ventilation based on pollution and visibility calculations.
- Lighting control
- Algorithms, plans and rules to support motorway use (Tunnel closures, lane closures, evacuation guide)
- Ice detection system and de-icing.
- Pumping systems



- Traffic management equipment (Variable message signs, Automatic gates, DCS, Traffic lights, Beacons, License plate readers, Bluetooth and radar).
- Automatic accident detection (DAI)
- SOS systems, telephone and loudspeaker.
- Radio communication systems.

